Saskatchewan
Environment

Lac La Ronge Endorsement Surveys 1997-2005

Fish and Wildlife Technical Report 2007-3

By
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April 2007

Recycled Paper

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Saskatchewan Environment
Fish and Wildlife Branch
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Table of Contents

Table of Contents i
List of Figures ii
List of Tables iii
Acknowledgements iv
Introduction 1
Methods 2
Results 3
  Lac la Ronge endorsements 3
    Number of endorsements issued and returned 3
    Size of lake trout harvested 5
    Estimate of lake trout harvest 7
  Mail out survey 8
    Response rate 8
    Time spent angling by species 9
    Preferred angling areas 11
    Catch per Unit Effort 14
    Release rate by species 18
    Harvest per Angler 20
    Harvest Estimates 20
Discussion 25
Conclusions 28
Management Recommendations 28
References 29
Appendix 1. Lac la Ronge Endorsement 30
Appendix 2. 2005 mail out survey 31

List of Figures

Figure 1. Map of Lac la Ronge showing the nine catch location zones 2
Figure 2. Number of Lac la Ronge endorsements issued annually by place of residency, 1997-2005. 4
Figure 3. Number of endorsements returned to Saskatchewan Environment annually by place of residence, 1997-2005. 5
Figure 4. Lake trout harvest by zone on Lac la Ronge, 1998-2005. 5
Figure 5. Length of lake trout harvested on Lac la Ronge, 1998-2005 6
Figure 6. Comparison of lake trout length at harvest versus length at maturity, Lac la Ronge, 2005. 6
Figure 7. Estimated lake trout harvest by residency based on Lac la Ronge endorsement returns, 1998-2005. 7
Figure 8. Comparison of estimated lake trout harvest (Kg) versus number of endorsement returns, 1998-2005. 8
Figure 9. Percentage of time spent angling for lake trout, pike, and walleye by residency for survey years 1999 (blue), 2001 (red) and 2005 (green), Lac la Ronge. 10
Figure 10. Preferred angling areas by La Ronge residents, 1997-2005. 11
Figure 11. Preferred angling areas by Saskatchewan residents, 1997-2005. 12
Figure 12. Preferred angling areas by Canadian residents, 1997-2005. 12
Figure 13. Preferred angling areas by United States residents, 1997-2005. 13
Figure 14. Preferred angling areas for all anglers, 1997-2005. 13
Figure 15. Catch per unit effort (fish per hour) by species by residency for survey years 1997 (black), 1999 (blue), 2001 (red), and 2005 (green) based on total time spent angling. 15
Figure 16. Catch per unit effort (fish per hour) by species by residency for survey years 1999 (blue), 2001 (red), and 2005 (green) based on time spent angling by species. 16
Figure 17. Percent released by species by residency for survey years 1997 (black), 1999 (blue), 2001 (red) and 2005 (green), Lac la Ronge. 19
Figure 18. Harvest per angler (number of fish) by species by residency for survey years 1997 (black), 1999 (blue), 2001 (red), and 2005 (green). 21
Figure 19. Harvest estimates (Kg) by species by residency for survey years 1997 (black), 1999 (blue), 2001 (red), and 2005 (green). 22
Figure 20. Percent of total catch and harvest of walleye on Lac la Ronge from Hunter Bay and Pickerel Bay, 2005 23
Figure 21. Percent of total catch and harvest of northern pike on Lac la Ronge from Hunter Bay and Pickerel Bay, 2005. 23
Figure 22. Percent of total catch and harvest of lake trout on Lac la Ronge from Hunter Bay and Pickerel Bay, 2005. 24

List of Tables

Table 1. Catch per unit effort (angler-hour) for walleye, northern pike, and lake trout from Lac la Ronge, 1950-2005. 17
Table 2. Catch per unit effort (angler-hour) for walleye and northern pike from Lac la Ronge, Jan Lake, Wakaw Lake, and Fishing Lake. 18
Table 3. Estimated harvest (Kg) by demographic group for Lac la Ronge main lake and Hunter Bay/Pickerel Bay, 2005. 25

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Introduction

Lac la Ronge is the fourth largest lake in Saskatchewan, with a water area of 130,700 hectares (Figure 1). Over the years it has been one of the most, if not the most studied lake in Saskatchewan. It supports a multi-use fishery comprised of Aboriginal sustenance harvest, recreational anglers, commercial fishers, and outfitting. Information on the lake morphology, limnology and fish populations have been reported on previously (Gloutney and Chen, 1992).

Once famed for its lake trout fishery, Lac la Ronge began showing serious signs of depletion in its trout populations in the mid 1990's, prompting action by the government to reduce harvest. Following extensive consultation through the Lac la Ronge Co-Management Board, the Lac la Ronge endorsement was implemented in 1997 for a five year trial period and has been in place every year since. At the same time, a restructuring of the commercial fishery took place, which involved reductions to commercial quotas for both the main lake and Hunter Bay. Angling limits for lake trout were reduced to two per day, with only four in total allowed per year.

The Lac la Ronge endorsement is a free angling licence that is required by all individuals fishing on Lac la Ronge in addition to the provincial angling licence for those over 16 years of age (Appendix 1). Anglers under 16 years of age require an endorsement when fishing on Lac la Ronge as well. Endorsements are available at local vendors that issue angling licences, as well as at the Saskatchewan Environment (SE) office in La Ronge.

The endorsement serves a dual purpose in the management of lake trout in Lac la Ronge. It provides fishery managers the number of anglers fishing on Lac la Ronge and their addresses for subsequent mail out surveys; as well as being an enforcement tool to regulate the new lake trout limits on the lake. Anglers are required to notch the back of the endorsement when they harvest a lake trout, and record the date, location and length of the trout harvested. At the end of the fishing season, anglers are asked to remit their endorsement so an estimate of lake trout harvest can be obtained. The lake is divided

into nine fishing zones in order to determine fishing pressure by area around the lake (Figure 1).

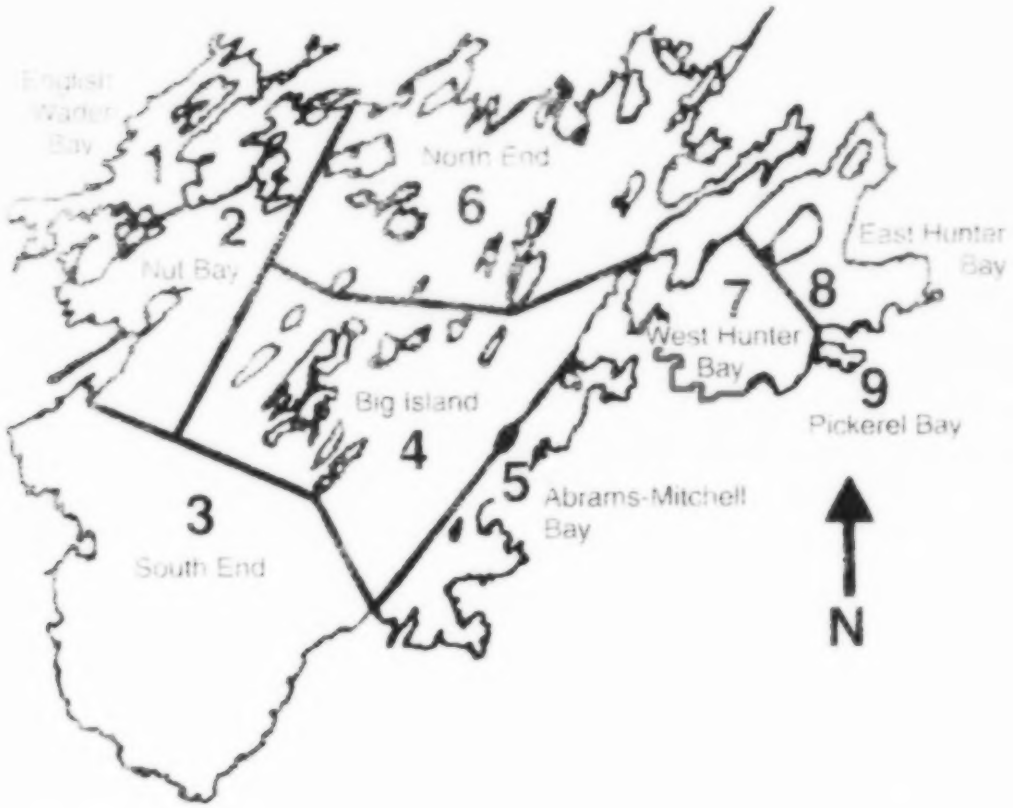


Figure 1. Map of Lac la Ronge showing the nine catch location zones

Methods

A mail out survey was conducted in years 1, 3, 5, and 9 following the implementation of the endorsement to gather information on angling pressure and harvest for all species on the lake, as well as anglers' opinions concerning fisheries management on Lac la Ronge (Appendix 2). A random sample of endorsement holders was selected based on four geographic areas of residence: La Ronge and area, Saskatchewan residents, Canadian residents and United States residents. Residents from places outside the four areas were

rare and have been added to the US residents for analysis. Surveys were sent to 25% of endorsement holders in each area. As an incentive for returning surveys, tackle boxes were given away as prizes in the first three survey years. All those surveyed were given the same survey, regardless of area of residence.

In order to obtain information that could be used in computing catch per unit effort as a measure of angling success, the mail out survey was changed slightly in 1999 and has remained relatively unchanged since then. As such, some of the information gathered in the latter surveys is not available from the initial survey.

This report provides information on fish catch and harvest gathered from the four mail out surveys, as well as from the endorsements that were returned to SE each year. Angler demographics are determined from the copies of the endorsements remitted by vendors for payment.

Results

Lac la Ronge endorsements

Number of endorsements issued and returned

Overall, the annual number of endorsements issued has decreased from 1997 to present (Figure 2). The largest number issued was 4,690 in the 1998/99 fishing season, and the lowest number was 3,300 in 2004/05. The greatest decline in number of endorsements issued is seen in Saskatchewan and US residents, with the former being 20% lower in recent years compared to the first few years of the endorsement. US residents have declined by over 50% during the same period. The number of endorsements issued to La Ronge residents and Canadian residents have remained fairly stable.

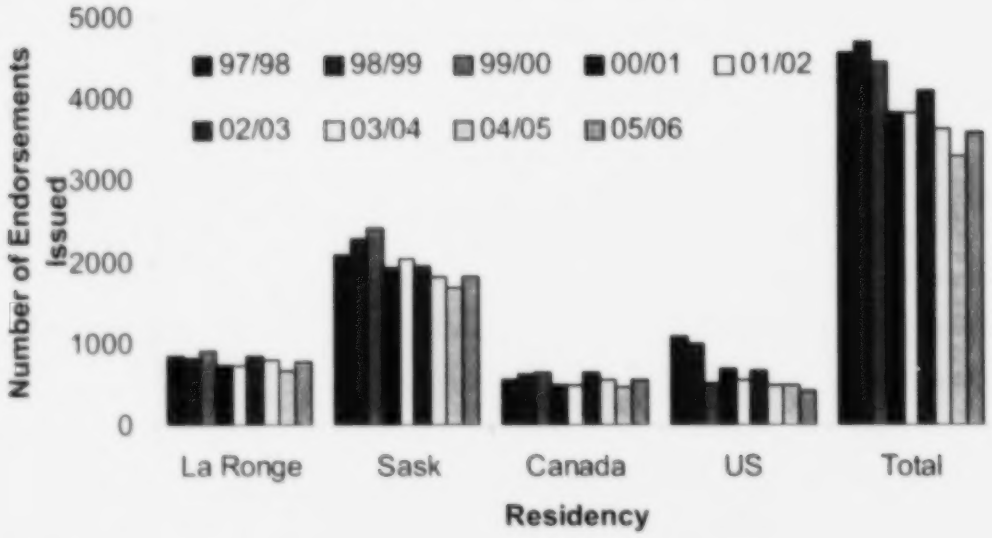


Figure 2. Number of Lac la Ronge endorsements issued annually by place of residency, 1997-2005.

The number of endorsements returned to SE at the end of the fishing season has varied greatly over the course of the endorsement period (Figure 3). A low of nine returns was seen in the first year, with a high of 166 in 2004/05. An advertising campaign was started in the 2004/05 Angers' Guide encouraging anglers to return their endorsements to SE and may have contributed to the higher number or returns seen in recent years. There has been no obvious trend in returned endorsements by angler origin over the course of the program.

While the number of returned endorsements does not allow accurate lake trout harvest estimates (to be discussed later), information can be collected regarding areas of lake trout harvest, length of trout harvested and season of harvest. As can be expected, the majority of the lake trout harvested on Lac la Ronge are from zones 7 and 8 (Figure 4), which constitute Hunter Bay (Figure 1). Few trout are harvested on the main lake, and those that are came from zones 4 and 6. Data is not available for 1997/98 due to low returns.

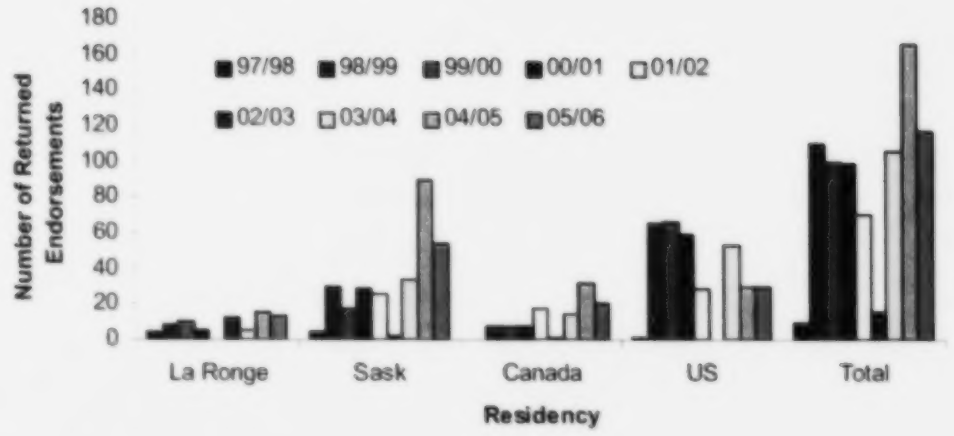


Figure 3. Number of endorsements returned to Saskatchewan Environment annually by place of residence, 1997-2005.

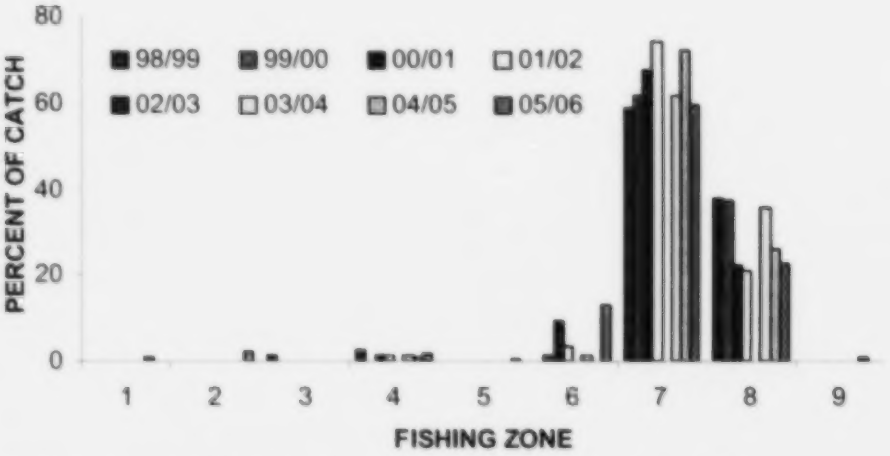


Figure 4. Lake trout harvest by zone on Lac la Ronge, 1998-2005.

Size of lake trout harvested

Length of trout harvested as reported on returned endorsements has not varied considerably from year to year (Figure 5). Average length has been between 58 and 62 cm. In any given year, over 80% of the lake trout harvested are 50 cm fork length or greater. For comparison, a 2005 lake trout spawning survey at Peters Island in Hunter

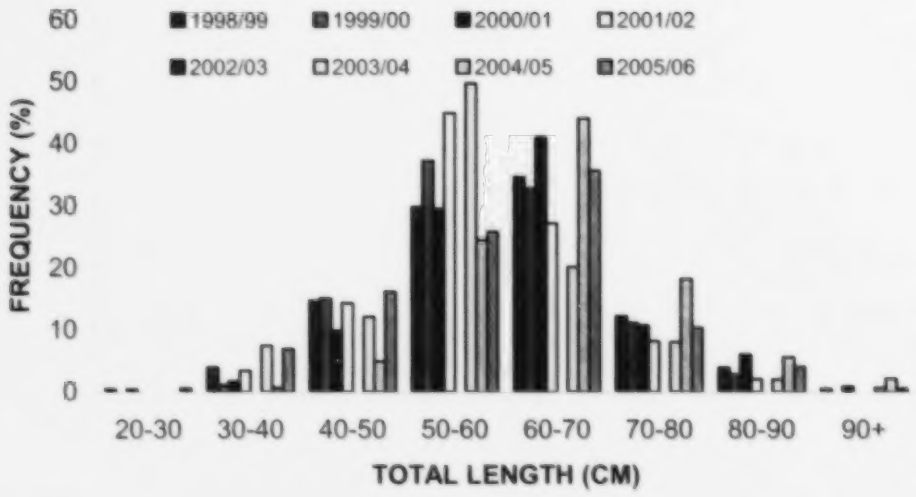


Figure 5. Length of lake trout harvested on Lac la Ronge, 1998-2005

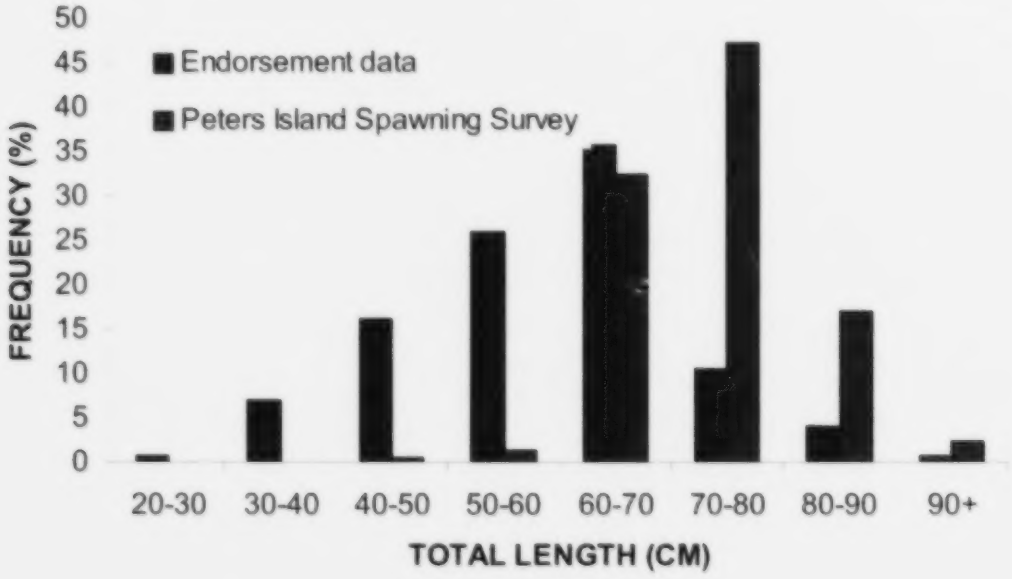


Figure 6. Comparison of lake trout length at harvest versus length at maturity, Lac la Ronge, 2005.

Bay revealed that fish first started appearing on the spawning grounds at approximately 50 cm (Figure 6). Assuming lake trout harvested by anglers who did not remit their endorsement are of similar size to those fish reported, it would appear that the majority of the larger spawning fish are not being harvested.

Estimate of lake trout harvest

An estimate of lake trout harvest from Lac la Ronge can be obtained through the returned endorsements. In all years, Saskatchewan residents harvested the most trout, with Canadian and US residents making up most of the remaining harvest (Figure 7). Data for La Ronge residents in 2001/02 is not available due to low endorsement returns, as is data for all residents in 2002/03. Following a peak in 2001/02 of 23,216 kg, the estimated lake trout harvest has decreased considerably in recent years to 11,379 kg in 2005/06. As mentioned earlier, the low number of endorsement returns may lead to an inaccurate harvest estimate. Also, it is possible that in the early years of the endorsement program, anglers may have thought that endorsements only needed to be returned if lake trout were harvested, which would also inflate harvest estimates. Figure 8 shows an inverse relationship between the number of endorsements returned and the estimated annual

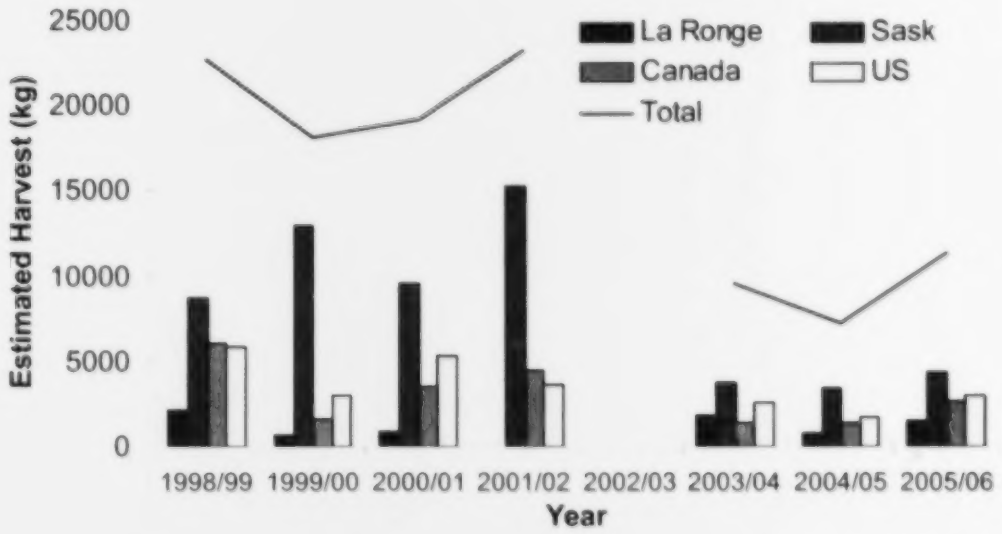


Figure 7. Estimated lake trout harvest by residency based on Lac la Ronge endorsement returns, 1998-2005.

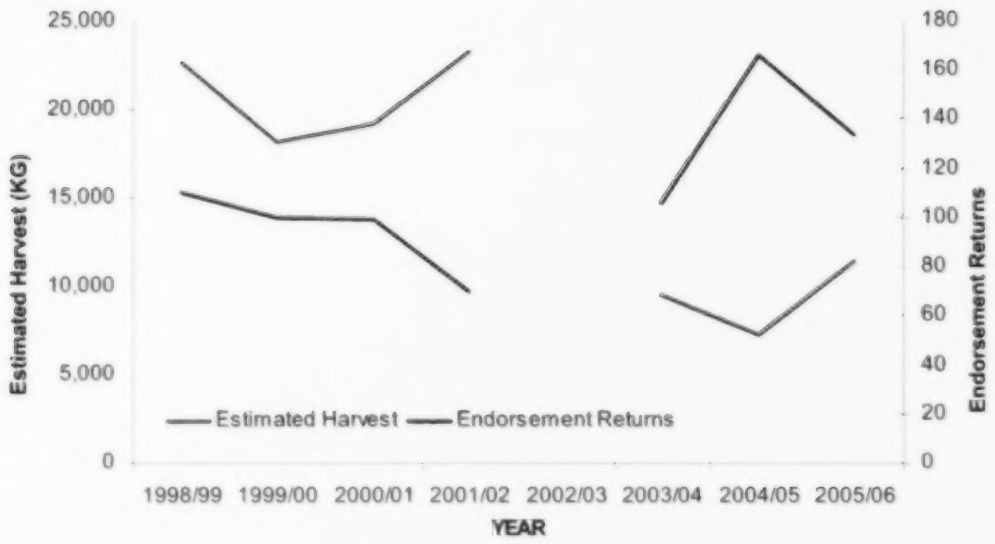


Figure 8. Comparison of estimated lake trout harvest (Kg) versus number of endorsement returns, 1998-2005.

harvest of lake trout. Regression analysis indicates this is a statistically significant relationship ($P<0.04$).

Mail out survey

While the returned endorsements provide information on date, length and location of lake trout harvested, as well as other angler demographics, they provide no information on harvests and catch rates of other species. In order to gather this information, a mail out survey was conducted in 1997, 1999, 2001 and 2005 to a subsample of endorsement holders.

Response rate

Approximately twenty five percent of all endorsement holders were surveyed in each of the four years, with a response rate averaging close to 50% in each of the years. A draw for tackle boxes was offered as incentive for responding during the first three surveys, however this was not done in the latest survey. Based on similar response rates both with and without the draw, it would appear that anglers on Lac la Ronge have an interest in the fishery and the incentives for response are not needed. Angler demographics for

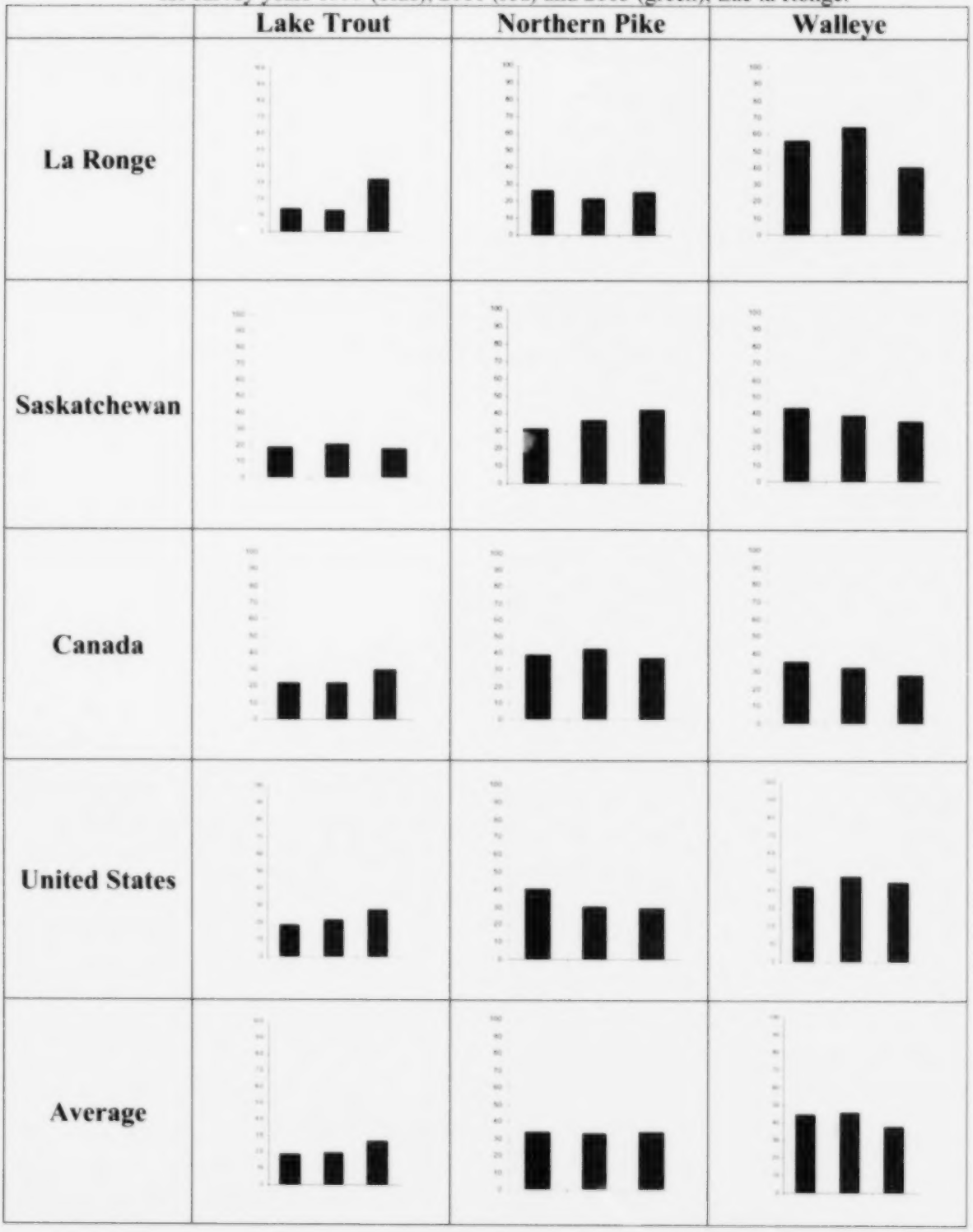
selecting survey respondents were broken down by geographic area, similar to the analysis of the returned endorsements.

As mentioned earlier, the survey questions were changed between 1997 and 1999 in order to gather better information. Therefore some information was not collected in the earliest, 1997 survey.

Time spent angling by species

Figure 9 shows the amount of time spent by each demographic group angling for lake trout, northern pike, and walleye in each of the three survey years. Over the course of the three survey years, there are several trends emerging within individual demographics, as well as overall within the fishery. La Ronge residents, as well as those from Canada and those from the United States show an increase in the amount of time spent angling for lake trout. In the four years between the last two surveys, lake trout angling by residents of La Ronge increased by 250%. Time spent angling for northern pike by all anglers has remained steady, with increases by Saskatchewan residents being offset by decreases in fishing pressure by Canadian and American anglers for this species. Walleye still remains the most sought after species in Lac la Ronge, although the overall amount of effort targeting this species has declined. La Ronge residents showed the greatest decrease in effort, with a drop of 38% between survey years. Walleye angling by the remaining demographics has not declined as sharply.

Figure 9. Percentage of time spent angling for lake trout, pike, and walleye by residency for survey years 1999 (blue), 2001 (red) and 2005 (green), Lac la Ronge.



Preferred angling areas

In each of the survey years, anglers were asked to indicate the top four fishing zones where they spent the majority of their time in order of time spent in each. This information was then weighted according to the order in which each zone was listed. The first zone listed received a weighting of four, the second zone three, the third zone two and the fourth zone received a weighting of one. Weighting of zones in this manner provides a more accurate idea of zone preference by giving the most preferred zone a higher ranking. La Ronge residents tended to shift from the north end of the lake (zone 6) in the initial survey to Pickerel Bay (zone 9), followed by a shift to Hunter Bay (zones 7/8) in the most recent survey (Figure 10). The east shore of the lake (zone 5) receives very little pressure from local anglers, while the Nut Bay/Bear Island (zone 2) area has seen increasing pressure over the years.

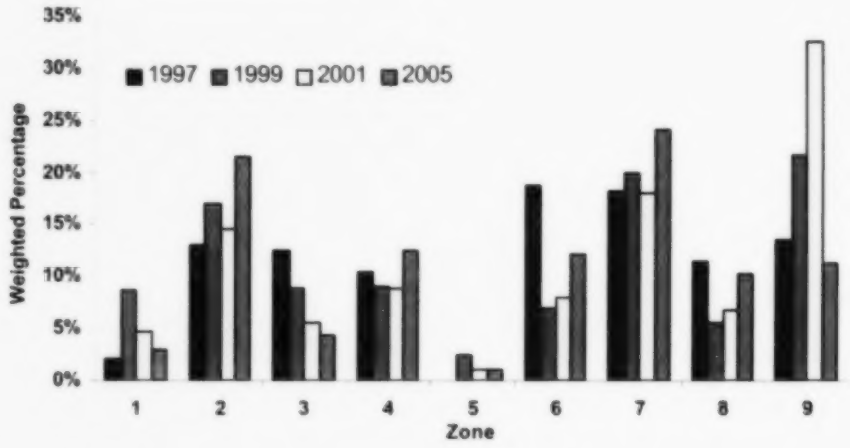


Figure 10. Preferred angling areas by La Ronge residents, 1997-2005.

Saskatchewan residents do not show as clear a shift in areas of preference as seen by La Ronge residents over the survey years (Figure 11). Fishing pressure has been greatest in the English Bay/Waden Bay area (zone 1) and Hunter Bay/Pickerel Bay (zones 7/8/9) with the other areas of the lake being exploited relatively evenly. Canadian residents shifted their pressure from the west side of the lake to Hunter Bay/Pickerel Bay, then back to the west side of the lake throughout the survey (Figure 12). For Saskatchewan and Canadian residents, zone preference may be related to cabin ownership demographics, which may explain fishing pressure in the main part of the lake.

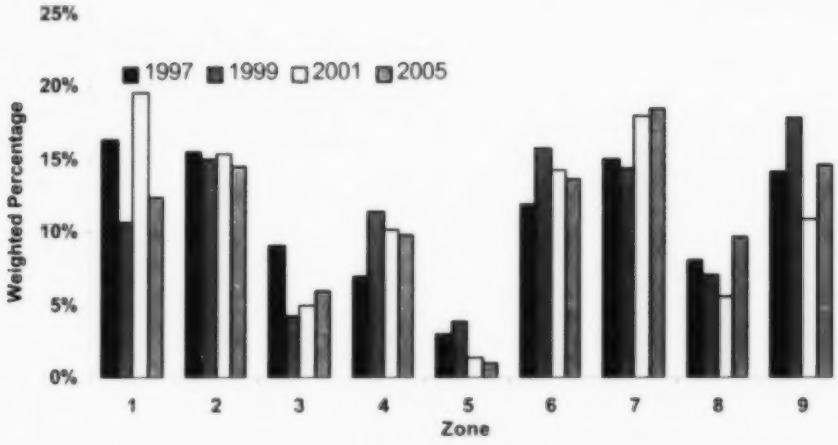


Figure 11. Preferred angling areas by Saskatchewan residents, 1997-2005.

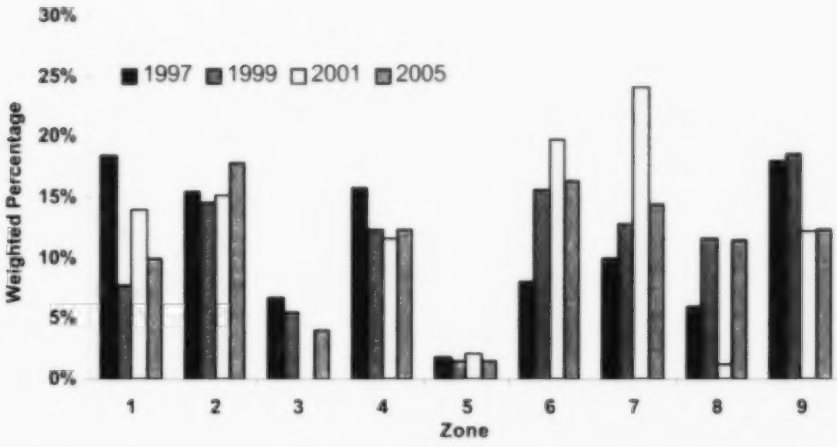


Figure 12. Preferred angling areas by Canadian residents, 1997-2005.

Residents of the United States show a markedly different preference in fishing areas as compared to the other angling groups (Figure 13). Fishing pressure in all survey years has been concentrated on Hunter Bay and Pickerel Bay (zones 7/8 &9), with pressure in Pickerel Bay increasing in each subsequent survey year. Very little pressure is seen on the main part of the lake. The majority of US residents surveyed indicated that they used the services of an outfitter when fishing on Lac la Ronge. Since the majority of outfitters are located in Hunter Bay, this likely accounts for the high amount of pressure this zone receives from this sector.

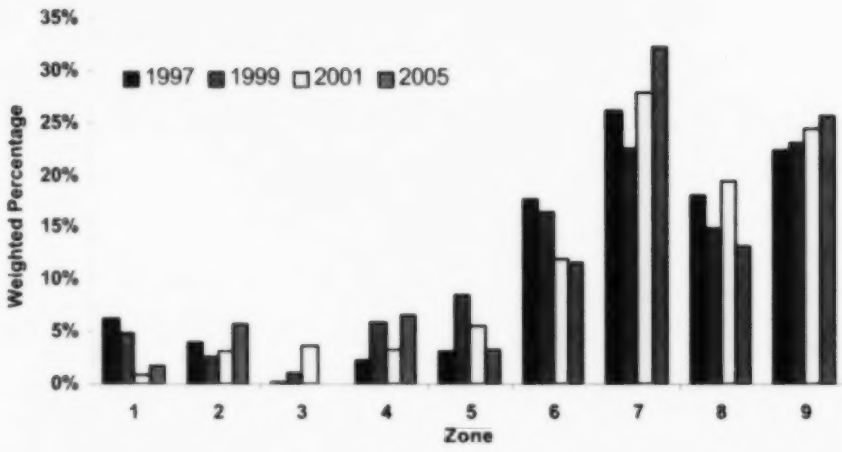


Figure 13. Preferred angling areas by United States residents, 1997-2005.

Overall fishing pressure has shifted little for all survey respondents over the course of the surveys (Figure 14), with Hunter Bay and Pickerel Bay being the most heavily utilized. There has been a slight decline in pressure on Pickerel Bay itself, which is offset by a slight increase on Hunter Bay. Pressure in zone 2 (Nut Bay) has been increasing somewhat, perhaps due to anecdotal evidence of the lake trout recovery in this area of the lake. The east shore of the lake still receives the lightest pressure.

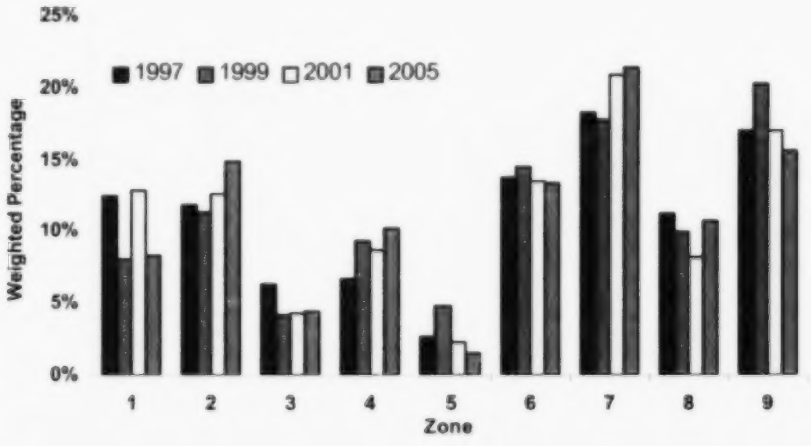


Figure 14. Preferred angling areas for all anglers, 1997-2005.

Catch per Unit Effort

Catch rates, or catch per unit effort (CPUE) was calculated for each of the survey years based on the total angling hours reported (Figure 15). In the initial survey, anglers were not asked to indicate the percentage of time spent angling for each species, instead they were asked to indicate their species preference. As such, CPUE cannot be calculated for that survey year based on actual time spent angling by species.

Regardless of residency, trends in CPUE were similar for the various species with the exception of Canadian lake trout angling success (Figure 15). Overall lake trout catch rates have increased throughout the four survey years, from 0.04 fish per hour to 0.08. This trend may be a sign of recovery of the stocks resulting from management action taken to reduce the harvest. The opposite is true of northern pike and walleye catch rates. A decline in catch rate is seen for both species over the course of the surveys. The CPUE has declined in 2005 to 0.20 fish per hour for pike and 0.23 for walleye, less than one half that reported in 1997 (0.41 and 0.56 fish per hour, respectively). Anecdotal evidence from anglers and outfitters regarding the quality of fishing for these two species supports these findings.

In order to get a better estimate of angling success, results were analyzed for CPUE based on actual time spent angling for each species. As mentioned earlier, this analysis is not available for the 1997 survey data, as the percentage of time spent angling by species was not asked on the survey. Figure 16 shows the results for the last three survey years, and results are somewhat different from those seen in Figure 15 based on total time spent fishing.

Based on actual time targeted toward trout, catch rates for this species have decreased slightly from 0.33 fish per hour in 1999 to 0.30 in 2005. Looking at the various residencies of lake trout anglers, no consistent trend in catch rate is seen. For northern pike and walleye however, catch rates from the 1999 survey to the 2005 survey have decreased for all anglers. Catch rates declined to 0.65 fish per hour for northern pike and 0.58 for walleye in 2005 from 0.78 and 0.95 fish

Figure 15. Catch per unit effort (fish per hour) by species by residency for survey years 1997 (black), 1999 (blue), 2001 (red), and 2005 (green) based on total time spent angling.

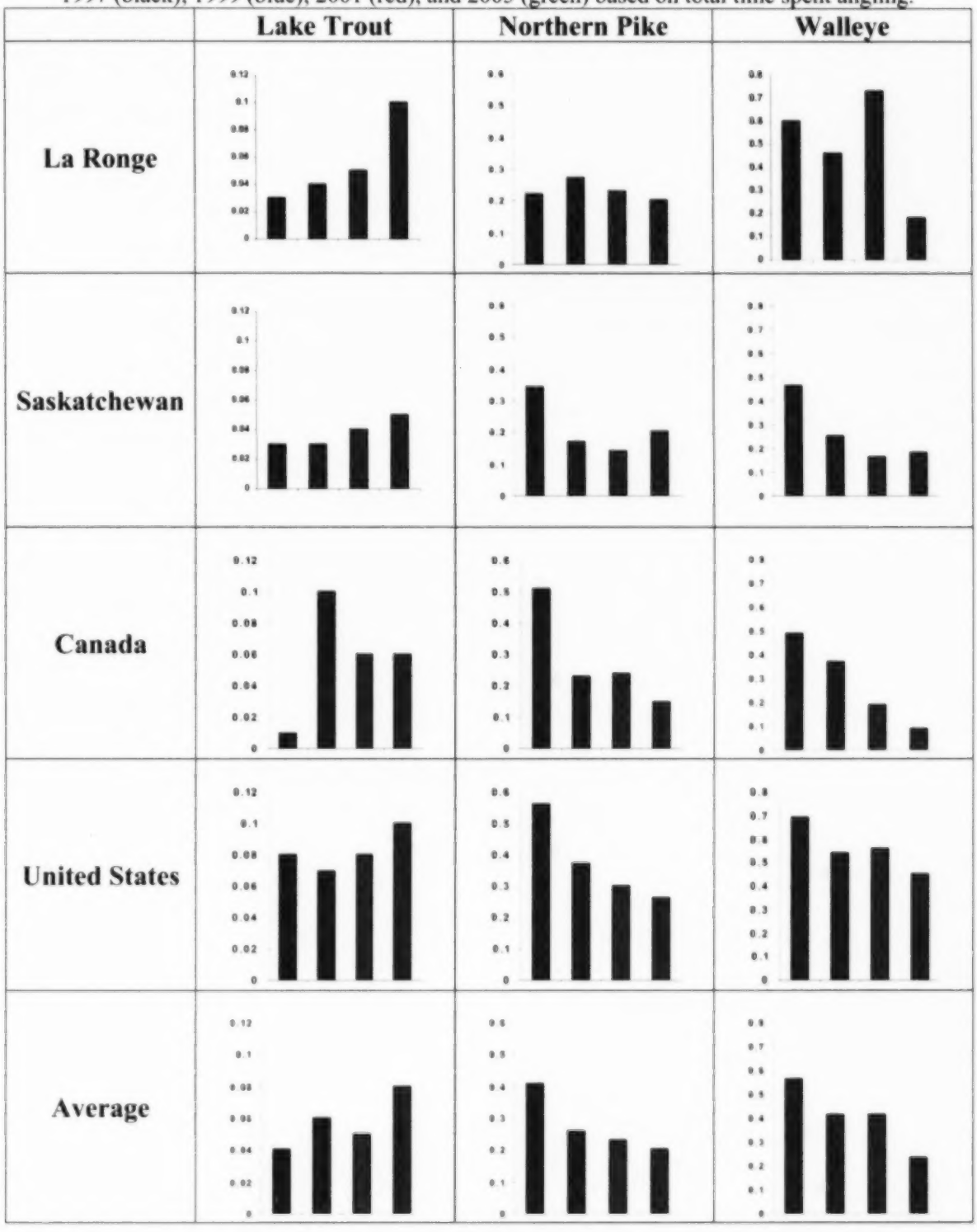
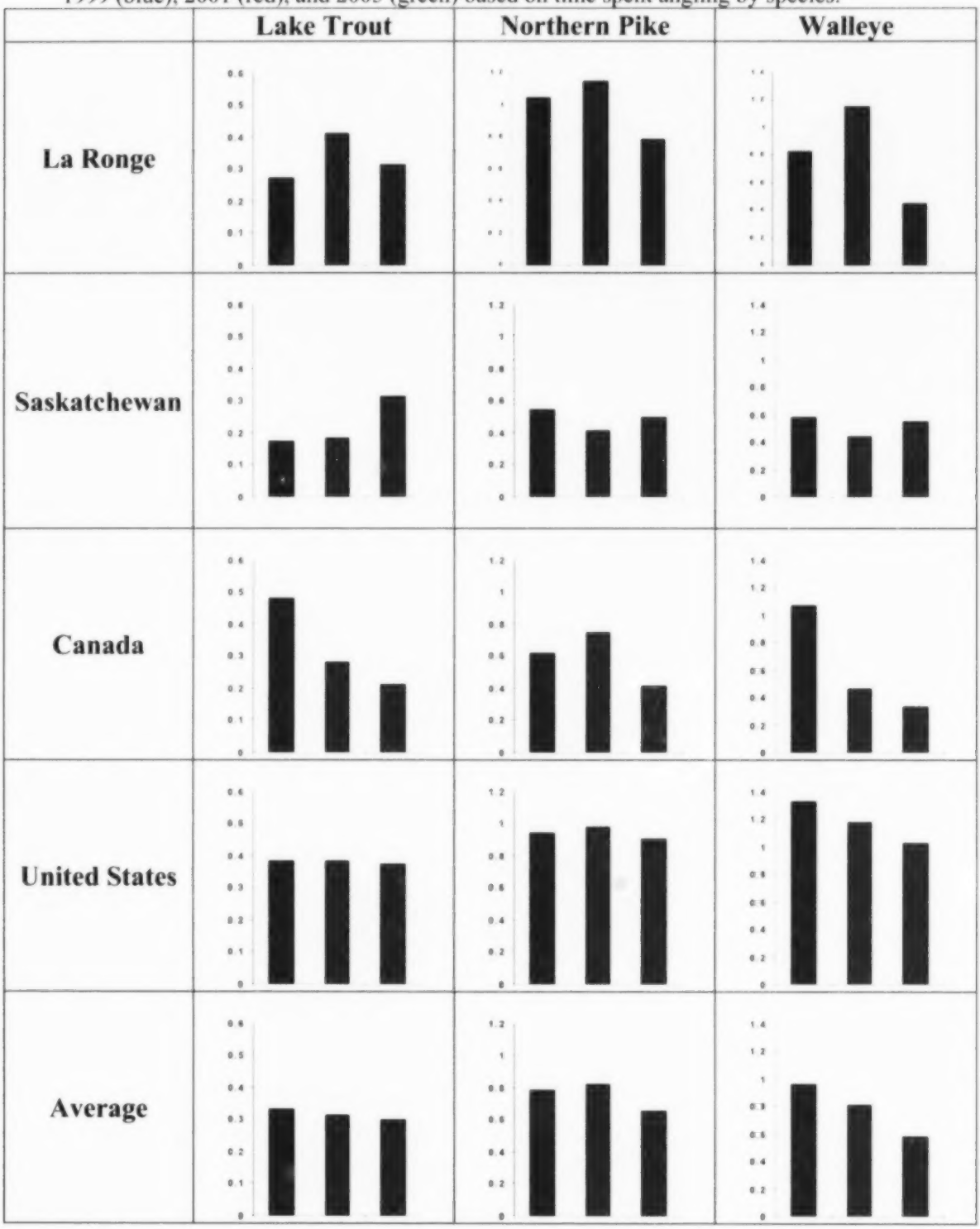


Figure 16. Catch per unit effort (fish per hour) by species by residency for survey years 1999 (blue), 2001 (red), and 2005 (green) based on time spent angling by species.



per hour in 1999, respectively. This analysis is most likely more accurate than use of total time fishing as anglers not targeting the species in question do not influence the catch rates expressed.

During the period 1950 – 1974 an annual creel survey was performed at Lac la Ronge to monitor angling pressure, catch, and harvest (Chen, 1977). While not directly comparable to the mail out surveys due to the different methodologies, comparisons in catch rates can be made. Table 1 shows catch per unit effort for the three game species in Lac la Ronge from 1950 to present.

Table 1. Catch per unit effort (angler-hour) for walleye, northern pike, and lake trout from Lac la Ronge, 1950-2005.

Year	Lake Trout	Northern Pike	Walleye
1950	0.5	1.6	0.9
1955	0.2	0.4	0.3
1960	0.2	0.55	0.25
1965	0.2	0.45	0.25
1970	0.2	0.4	0.5
1974	0.2	0.4	0.5
1997	0.04	0.41	0.56
1999	0.06	0.26	0.41
2001	0.05	0.23	0.41
2005	0.08	0.20	0.23

Results from creel surveys in other Saskatchewan lakes are shown for comparison purposes in Table 2. Data for other lakes with lake trout is not available. Catch rates for walleye and pike in Lac la Ronge are lower than those seen in other lakes in the province.

Table 2. Catch per unit effort (angler-hour) for walleye and northern pike from Lac la Ronge, Jan Lake, Wakaw Lake, and Fishing Lake.

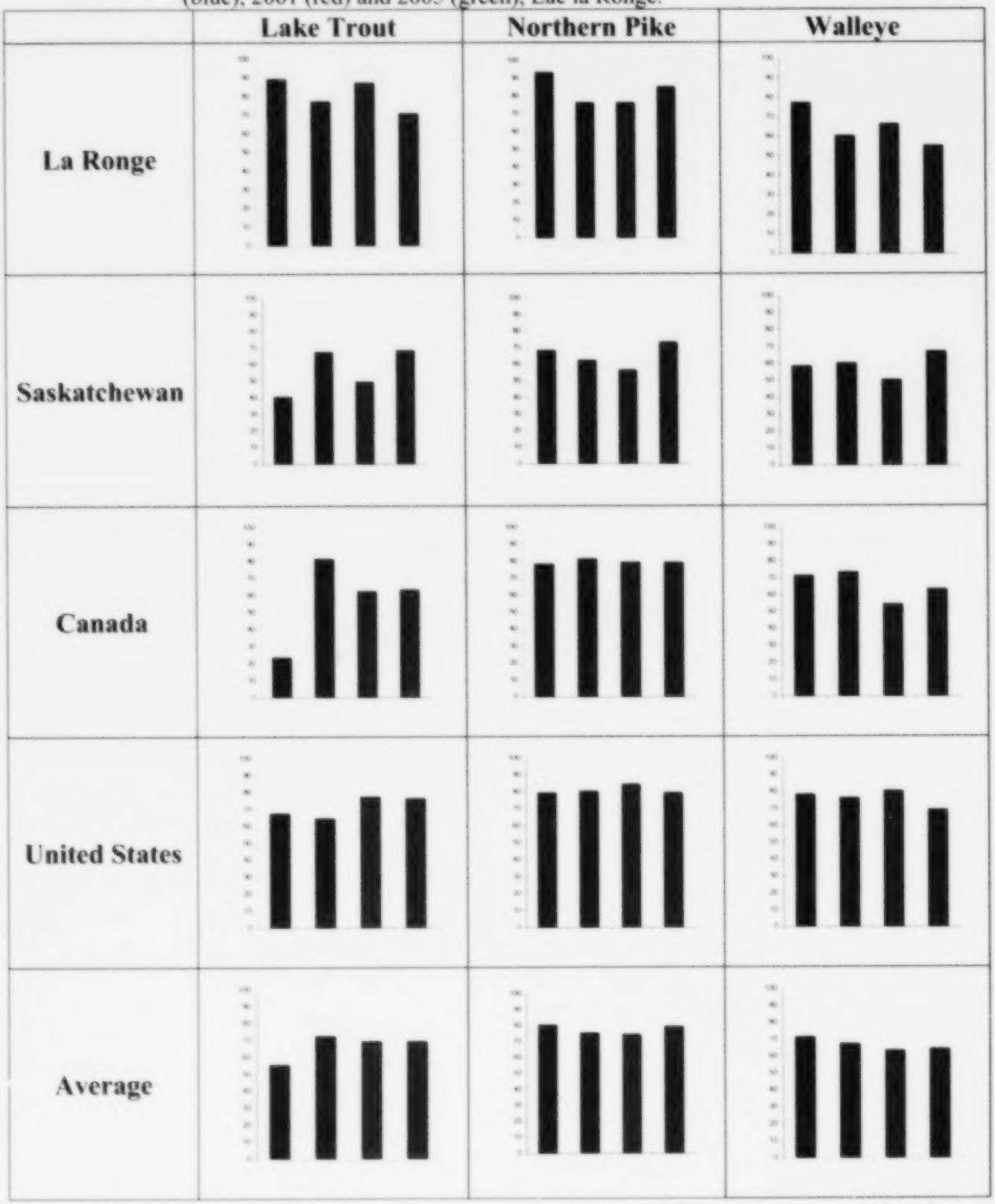
Lake	Year	Northern Pike	Walleye
Lac la Ronge	1997	0.41	0.56
	1999	0.26	0.41
	2001	0.23	0.41
	2005	0.20	0.23
Jan Lake[a]	2002	0.40	0.90
Wakaw Lake[b]	1999	0.23	0.05
Fishing Lake[c]	2000	1.11	1.01

[a] Duffy - in print
[b] Merkowsky, 2001
[c] Merkowsky, 2005

Release rate by species

Based on information collected during the mail out surveys using catch and harvest data, a release rate by species can be calculated by demographic. Figure 17 shows this breakdown and some trends that may be related to fish populations in Lac la Ronge. La Ronge residents have shown an overall decrease in release rate of both lake trout and walleye. Release rates for northern pike have increased during the latest survey, but not to the 93% seen in 1997. Lake trout release by Saskatchewan residents has increased considerably since the initial survey, while pike and walleye show a slight increase after several years of decreasing release rates. Similar to Saskatchewan residents, Canadian anglers showed a dramatic increase in release of lake trout, increasing from 23% to over 60%. Northern pike release rates have remained constant near 80% while walleye have shown an overall decrease. US residents showed a slight increase in release of lake trout, while northern pike and walleye have seen slight decreases. Overall, anglers appear to be releasing more lake trout in recent years, while releasing fewer walleye. The pike release rate has remained relatively constant throughout the survey years.

Figure 17. Percent released by species by residency for survey years 1997 (black), 1999 (blue), 2001 (red) and 2005 (green), Lac la Ronge.



Harvest per Angler

Harvest per angler was calculated for each of the four survey years to account for differences in the number of anglers from each demographic and to standardize the results. Figure 18 shows the average harvest per angler for all four survey years. On average, the number of lake trout harvested per angler has increased slightly, from 0.46 in 1997 to 0.57 in 2005. An increase in lake trout harvest per angler is seen for La Ronge residents, while Saskatchewan and United States residents have shown decreases. Canadian resident harvest per angler has remained stable. Similar to catch rates, harvest per angler for northern pike and walleye has decreased since the initial survey. Residents of the United States show the biggest decrease in harvest for northern pike, although they continue to harvest the most per angler. The situation is similar for walleye, with US residents harvesting the most per angler. La Ronge residents had the highest walleye harvest per angler in 1997 and 2001, and the second highest in 2005. Given the proximity of the community to Lac la Ronge, it is most likely that harvest from this sector is closely tied to walleye population fluctuations.

Harvest Estimates

Harvest estimates were calculated for all species for each of the four survey years based on the number of fish kept as reported (Figure 19). The average weight of individual fish harvested was estimated from average fish length from gut can counts, and length-weight relationships calculated from test netting surveys done in 2001.

Total harvest for all species has been decreasing since the start of the surveys, with the biggest declines seen in northern pike and walleye. Lake trout harvest by La Ronge residents has increased in the last survey, while harvest by the other three demographics has decreased. Total lake trout harvest has declined from 5,373 kg in 1997 to 3,809 kg in 2005. In all survey years, Saskatchewan residents harvested the most lake trout. Northern pike harvests have declined to a total of 4,236 kg, approximately one quarter of that seen in the 1997 survey. Walleye harvests show even greater decreases, from 32,900 kg to 6,752 kg over the same period. Similar to lake trout, Saskatchewan residents harvested the most fish out of all user groups.

Figure 18. Harvest per angler (number of fish) by species by residency for survey years 1997 (black), 1999 (blue), 2001 (red), and 2005 (green).

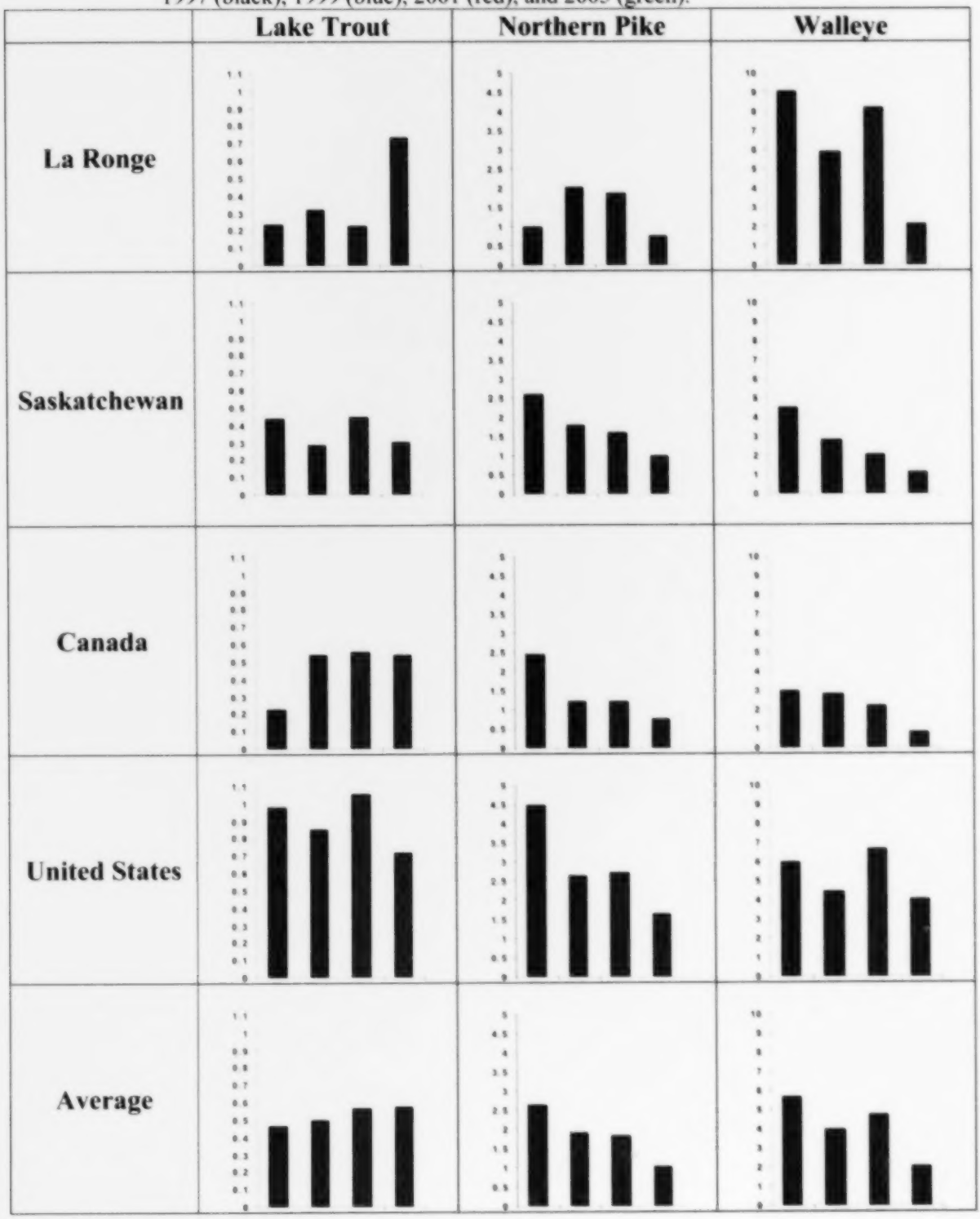
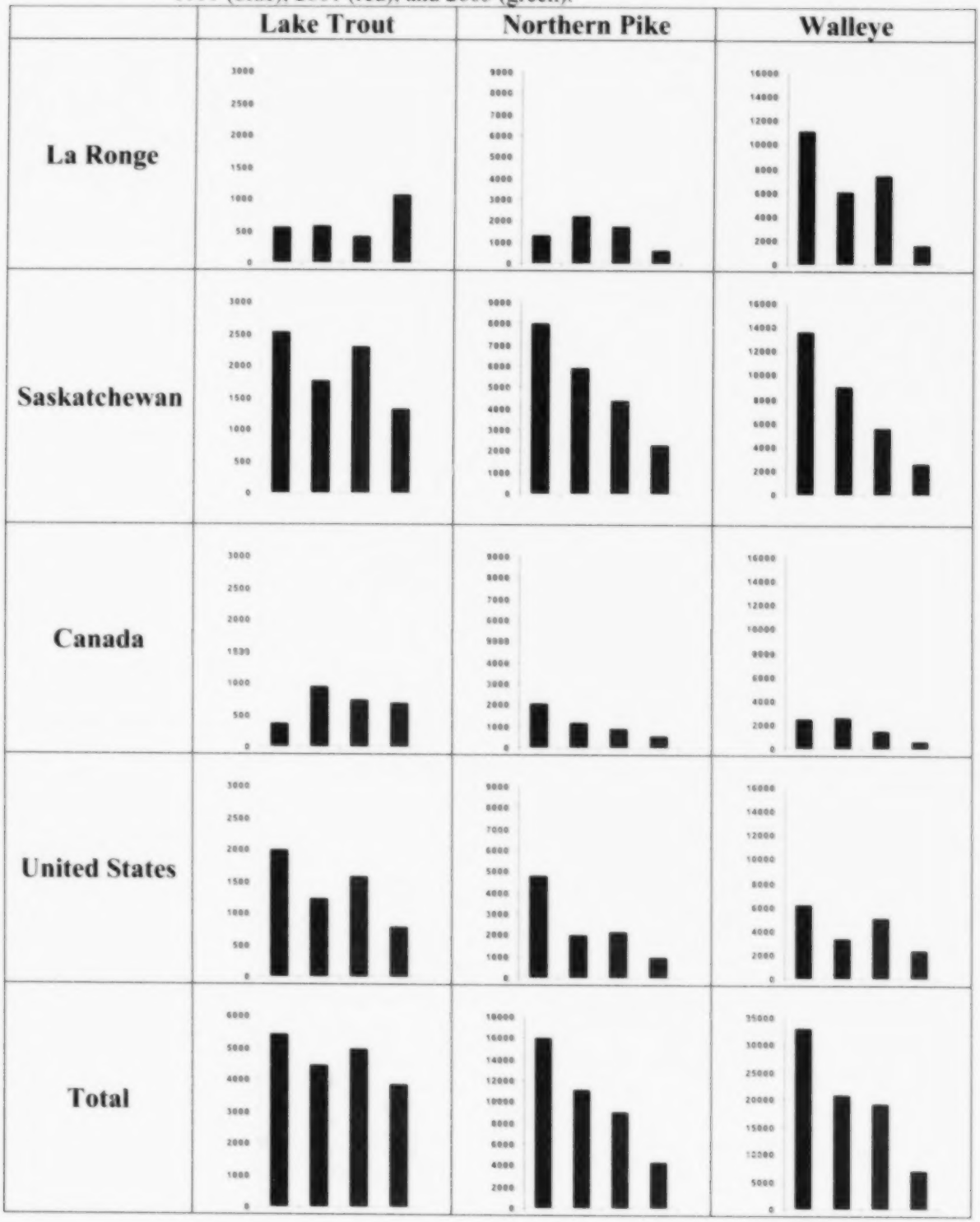


Figure 19. Harvest estimates (Kg) by species by residency for survey years 1997 (black), 1999 (blue), 2001 (red), and 2005 (green).



In the 2005 survey, respondents were asked to indicate their catch and harvest for the main lake (zones 1-6) and Hunter and Pickerel Bays (zones 7-9) in order to estimate the harvest for these two different parts of Lac la Ronge. Figures 20-22 show the percentage of total catch and harvest for walleye, northern pike, and lake trout from Hunter and Pickerel bays, respectively.

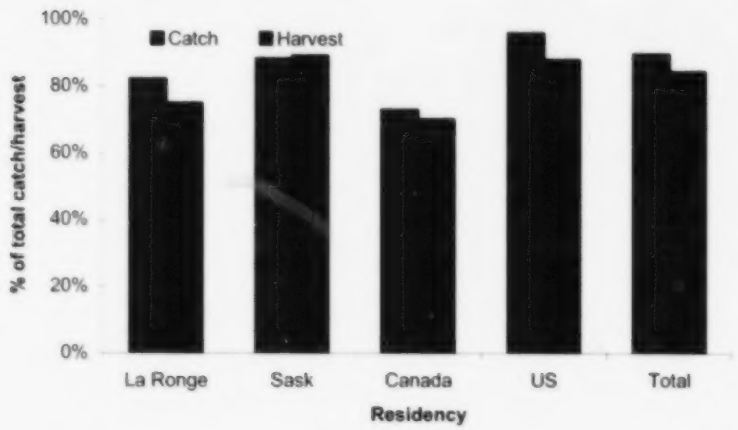


Figure 20. Percent of total catch and harvest of walleye on Lac la Ronge from Hunter Bay and Pickerel Bay, 2005

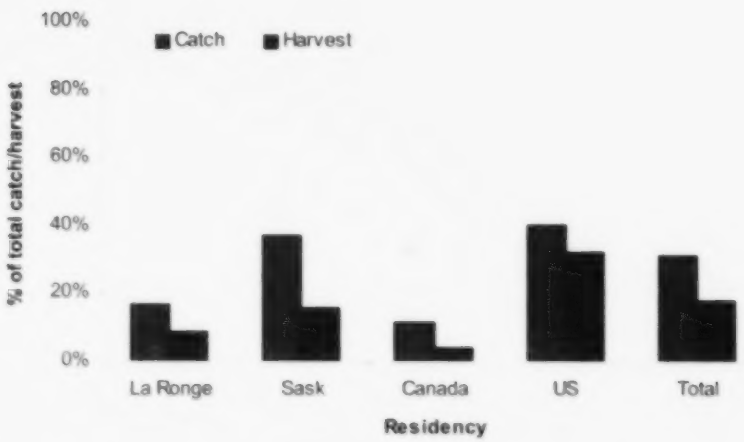


Figure 21. Percent of total catch and harvest of northern pike on Lac la Ronge from Hunter Bay and Pickerel Bay, 2005.

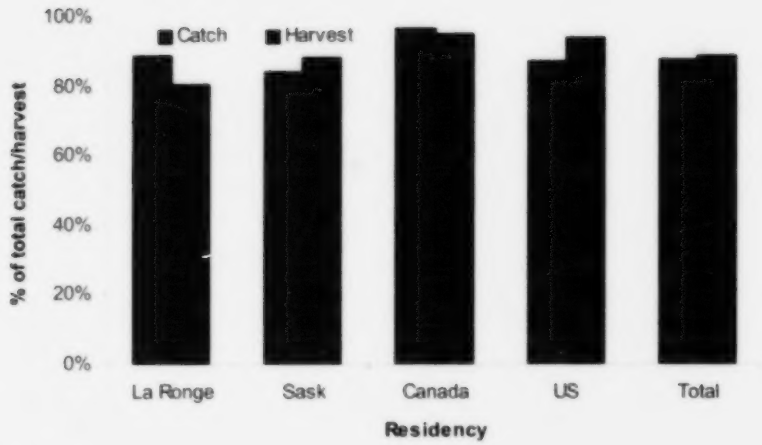


Figure 22. Percent of total catch and harvest of lake trout on Lac la Ronge from Hunter Bay and Pickerel Bay, 2005.

With the exception of northern pike, the majority of game fish harvested by the recreational fishery is from Hunter Bay and Pickerel Bay. On average, almost 85% of all walleye and 88% of lake trout harvested on Lac la Ronge are from this area. The total catch by lake area of these two species shows a similar trend. The opposite is true of northern pike. Less than 18% of all northern pike harvested are from Hunter Bay and Pickerel Bay, while up to 40% of total catch is from these areas for certain demographics.

Estimates of harvest for the two areas of the lake can be calculated based on the total estimated harvest for the lake and the percent harvest by area. Table 1 shows the total estimated harvest by demographic group for the main lake and Hunter Bay and Pickerel Bay.

Table 3. Estimated harvest (Kg) by demographic group for Lac la Ronge main lake and Hunter Bay/Pickerel Bay, 2005.

	Lake Trout		Northern Pike		Walleye	
Residency	**Main Lake**	**Hunter Bay**	**Main Lake**	**Hunter Bay**	**Main Lake**	**Hunter Bay**
La Ronge	202	837	504	45	369	1,105
Saskatchewan	156	1,153	1,911	346	271	2,212
Canadian	34	649	487	18	157	366
United States	49	729	630	295	274	1,998
Total	441	3,368	3,532	705	1,071	5,683

Discussion

The Lac la Ronge endorsement as a whole has been a successful tool in the management of lake trout on Lac la Ronge. It has provided fisheries managers with a valuable source of information on fishing pressure and harvest that is normally not available, or would require lake-wide creel surveys to obtain. While there is an ongoing cost associated with the program (vendor fees, cost of printing endorsements, cost of surveys etc.), on an annual basis it is considerably less costly than lake wide creels.

The decrease in the number of anglers fishing on Lac la Ronge, as evidenced by the lower number of endorsements issued annually over the course of the program, may not be directly attributable to the lowered lake trout limits. Survey results indicate that the majority of anglers prefer angling for northern pike and walleye to lake trout. Recent concerns over populations of pike and walleye in Lac la Ronge may be a factor in the diminishing number of anglers.

The number of endorsements returned to SE at the end of the angling season has varied over the years, which leads to unreliable estimates of harvest based on returns alone. The inverse relationship between number of endorsements returned and estimated lake trout harvest may be indicative of this, as is the estimated harvest based on endorsement surveys. The returned endorsements, however, do provide data on where lake trout

harvest occurs, as well as the size of trout being harvested. Not surprisingly, the majority of the lake trout harvest on Lac la Ronge is from Hunter Bay.

The mail out survey provides much more information on total fish harvest by the sport fishery on Lac la Ronge than the endorsement returns. Information on catch and harvest rates for the three sport fish species is available, as is information on where the majority of the angling pressure is occurring on the lake. The response rate for the four surveys has been encouraging, averaging almost 50% in each year. This represents approximately 12.5% of the angling population based on survey being mailed to 25% of endorsement holders.

A slight shift is seen in the percent time spent angling by species, with effort towards lake trout increasing as walleye effort decreases. Again, this may be in response to population dynamics of those species. As lake trout stocks increase (presumably due to management actions taken) and walleye and northern pike stocks decrease, pressure on those species shifts accordingly. This is also evidenced through changes in the preferred angling areas on Lac la Ronge. Pickerel Bay, traditionally a popular destination for walleye anglers, has seen decreases in preference by most of the demographics.

Care should be taken when interpreting preferred angling areas by the different demographics as reported in the mail out surveys. Sixty four percent of American anglers used the services of outfitters in 2005, and therefore are more likely to angle in areas close to outfitting camps (i.e. Hunter Bay and Pickerel Bay). For Canadian anglers, 30% were cabin owners, with only 22% using outfitters. A similar result is seen for Saskatchewan anglers, with values of 39% and 20% respectively. Anglers who own cabins on the lake or use the provincial campgrounds are more likely to utilize those portions of the lake that are in close proximity, as seen in the more even distribution of pressure by Canadian and Saskatchewan resident anglers. Given that La Ronge residents presumably have greater access to fishing on Lac la Ronge, the areas that they preferred may closer reflect changes in fish populations. The substantial drop in preference for

Pickerel Bay and increase in Hunter Bay and Nut Bay mirrors anecdotal evidence of walleye declines and lake trout recoveries in these areas.

Catch per unit effort (CPUE) was calculated two different ways: using total time spent fishing for all species to allow comparison to 1997 survey results; and using actual time spent fishing for that particular species. The latter results are considered to be more accurate given that the effects on anglers not targeting that species are excluded. CPUE for lake trout has remained constant over the last three surveys, with no trends seen within the demographic groups angling for this species. Northern pike and walleye CPUE has decreased over the same period, with this trend being evident in most of the demographic groups. The constant CPUE for trout despite increasing population abundance is most likely due to the corresponding increase in effort for that species. As more, inexperienced anglers enter the fishery, they will tend to lower the CPUE.

The release rate for lake trout has leveled off at approximately 70% for all anglers, while that for northern pike and walleye has decreased over the course of the four surveys. This result for pike and walleye is indicative of declining abundances, since anglers will typically keep proportionately more of their catch. For lake trout, the steady release rate, as opposed to an increasing rate, may be due to anglers keeping more trout to offset their lower harvest of other species.

Harvest per angler may substantiate this, as the number of lake trout harvested per angler has increased steadily over the course of the surveys. Of particular note is the large increase seen for La Ronge residents. Decreases in harvest per angler are seen for both northern pike and walleye for all demographics, to less than half that seen in the original survey. Large harvests of walleye by La Ronge residents were seen in 1997 and 2001, likely due to the easy accessibility of the lake. For the current survey, US residents harvested the most pike and walleye per angler, and were only slightly behind La Ronge residents for lake trout harvest per angler.

Harvest estimates for lake trout from the mail out surveys are considerably lower than those based on the endorsement returns for the same period. Harvests for each species shows a downward trend throughout the course of the surveys, especially for northern pike and walleye. The majority of the lake trout and walleye harvest occurs in Hunter Bay and Pickerel Bay, while northern pike is mostly harvested from the main lake. Although there is no survey data to calculate harvest estimates by area from the first three surveys, it is likely that a similar percentage of harvest by species would be seen. Zone preference, as well as time spent angling by species supports this theory.

Conclusions

1. The Lac la Ronge endorsement is an effective tool for fisheries management and enforcement of regulations. The endorsement is also a source of information on angler demographics and is essential for the mail out surveys.
2. The returned endorsements do not provide an accurate estimate of lake trout harvest, however, they do provide essential information on harvest area and size of trout harvested.
3. Lake trout is not the preferred species on Lac la Ronge, although angling pressure for them is increasing. Walleye is the preferred species followed by northern pike.
4. CPUE for lake trout has remained constant, while decreasing for pike and walleye.
5. Anglers are harvesting fewer pike and walleye per angler, while harvesting more lake trout.
6. Total harvest for all species by recreational anglers has decreased over the course of the surveys.

Management Recommendations

1. The Lac la Ronge endorsement should be continued for an indefinite period as it has been shown to be an important management tool.
2. The mail out survey of endorsement holders should continue every two years as it has proved a valuable tool for information collection.
3. The apparent decline in northern pike and walleye stocks should be addressed through further management actions, developed in consultation with fisheries users of the lake.

References

Duffy, In Print – Jan Lake Fisheries Assessment and Creel Survey, 2002. 48p.

Gloutney, B. and M. Chen. 1992. Status of the Lac la Ronge Fishery 1989 and 1990. Fisheries Technical Report 92-2. 88p.

Merkowsky, J. 2001. Wakaw Lake Fisheries Assessment 1999. Fish and Wildlife Technical Report 01-4. 21p.

Merkowsky, J. 2005. Assessment of gamefish populations – Fishing Lake 2000. Resource Technical Report 2005-1. 25p.

Appendix 1. Lac la Ronge Endorsement

Lac la Ronge Lake Endorsement
_____ - _____ Season

No Fee No. 104 - 32647

Angling Licence #						
Last Name						
First Name				Initial		
Sex	M F	Birthdate	DD	MM	YY	
Street						
City/Town						
Province		Postal Code				
Date of Issue	DD	MM	YY	Vendor #		
Signature of Licensee						

Anglers age 16 and older must have a valid Angling Licence to obtain and use this endorsement. Endorsement is not valid unless signed by licensee, must be carried while angling, and is non-transferable.

Lake Trout Limit: Two lake trout daily.
Four lake trout annually.

Record your lake trout catch on the reverse side.

Please report any fishery violations to the T.I.P. line.

Saskatchewan Environment

TURN IN POACHERS
T.I.P.
1-800-667-7561
24 HOURS TOLL FREE

Front

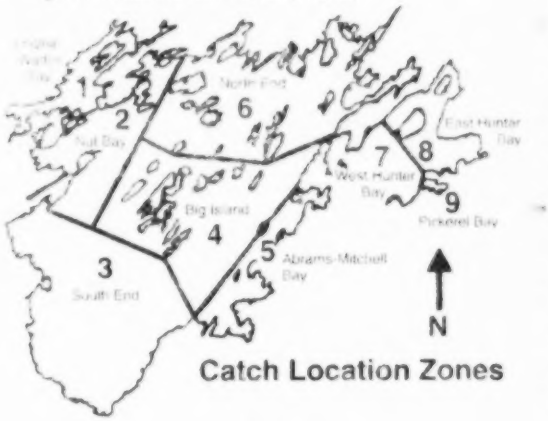
Lac la Ronge Lake Trout Catch Record

Immediately upon catching and **retaining** a lake trout you must:

a) Cut out and remove a notch [illegible].
b) On the same line record the date, catch location (see map) and total length of the fish.

Date	Catch Location (Zone)	*Total Length
DD MM YY		cm
DD MM YY		
DD MM YY		
DD MM YY		

*Length is measured with the tail pinched



Catch Location Zones

Anglers: Please return this endorsement, when done angling to:

Saskatchewan Environment
P.O. Box 5000
La Ronge, Saskatchewan
S0J 1L0

Back

Appendix 2. 2005 mail out survey

Saskatchewan
Environment

2005 Lac la Ronge Angler Survey

In 1997, Saskatchewan Environment (SE) introduced the Lac la Ronge Angling Endorsement, which is required by all anglers who fish on Lac la Ronge. The endorsement enables SE to determine the number of people who fish on Lac la Ronge each year, and to survey some of those anglers to estimate fishing effort and harvest.

Your name was randomly chosen from the list of all endorsements issued during the 2005/06 season. Since only a limited number of anglers will receive this survey, *your response is very important*. Please take a few minutes to fill out the survey, and return it in the postage-paid envelope as soon as possible. **Include only information about the fishing you did between May 21 and September 30, 2005, not others in your group.**

Also, if you have completed your angling on Lac la Ronge for the 2005 season, please attach your Lac la Ronge endorsement with your survey, so we can estimate the length of lake trout being harvested from Lac la Ronge. Your cooperation in this survey is appreciated, and will assist in managing this fishery.

1) Please circle your area of residence:

La Ronge and area Saskatchewan Canada United States

2) While fishing on Lac la Ronge, please indicate the percentage of time you spent fishing for the following species:

Lake Trout ____ Northern Pike ____ Walleye ____ Perch ____ Other ____

I did not fish on Lac la Ronge in 2005 _____ (please go to Question 9)

3) If you are not a resident of La Ronge and area, please indicate where you stayed while fishing on Lac la Ronge:

Outfitter____ Private Cabin_____ Houseboat____

Local hotel____ Campground____ Friends/Relatives_____

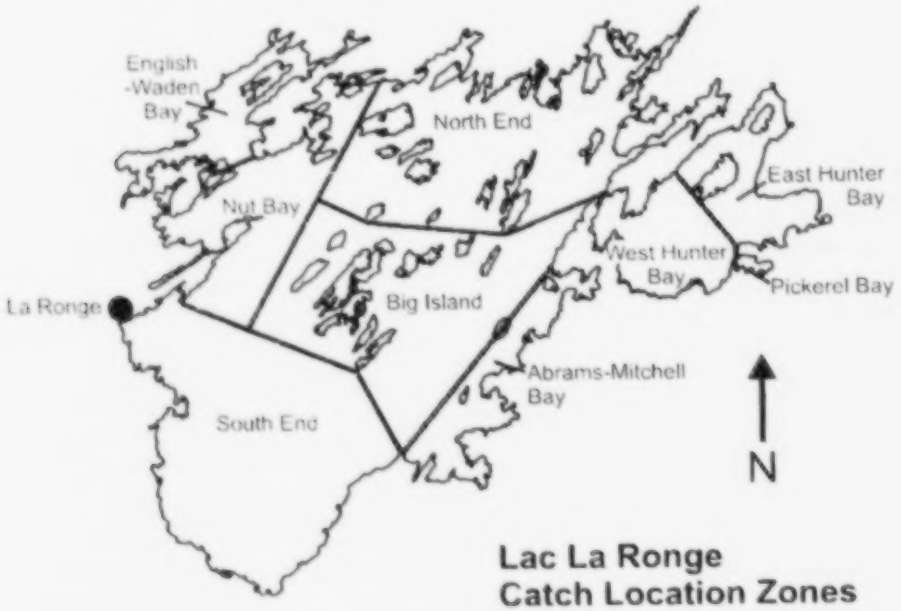
4) Please record the number of fish of each species that you caught and that you kept between May 21, 2005 and September 30, 2005 on Lac la Ronge by general location:

	Main Lake		Hunter Bay / Pickerel Bay	
	Caught	**Kept**	**Caught**	**Kept**
Lake Trout				
Pike				
Walleye				
Perch				
Other (specify)				

5) How many days and how much time did you spend fishing on Lac la Ronge (including Hunter Bay) between May 21, 2005 and September 30, 2005?

_____ days _____ hours per day

6) The map below shows 9 separate zones. Please mark the zones that you fished during 2005 by marking a number that corresponds to the amount of time you fished in each zone (i.e. The zone you fished the most in should be marked with a 1, the zone you fished in the second most should be marked with a 2 etc.). Please leave unfished zones blank.



Lac La Ronge
Catch Location Zones

7) How would you rate the overall quality of angling on Lac la Ronge?

Excellent ____ Good ____ Fair ____ Poor____

8) While fishing on Lac la Ronge, did a Conservation Office check your fishing licence and Lac la Ronge Endorsement?

Yes ____ No ____

9) Do you intend to fish on Lac la Ronge between October 1, 2005 and March 31, 2006?

Yes ____ No ____

if yes, please estimate the number of days you expect to fish during this time:

____ Days.

10) I would support lowered angling limits on Lac la Ronge

Agree ____ Disagree ____ Indifferent ____

11) Do you have any comments or suggestions about the Lac la Ronge fishery?

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Thank you again for taking the time to fill out and return your survey.